I.Project Title and Project Purpose Statement

Title: The Nonconnah Corridor Education and Engagement Program (NCEEP)

Summary Description: Historical development patterns within Memphis, TN have created geographically isolated neighborhoods in the Southern portion of the city. As the city's center for commerce and industry, residential communities in this area shoulder the majority of the more contaminated stormwater runoff. This project seeks to increase public participation in information gathering by having high school students in these neighborhoods take and analyze water samples from their local watershed, Nonconnah Creek.

Project Location: NCEEP will focus on schools that draw from the communities along the Nonconnah Creek Watershed. Specifically, this entails the Southern half of Memphis, TN and the zip codes 38116, 38113, 38114, 38109, 38106, and 38116.

Clean Memphis' NCEEP is a student-centered workshop that addresses both the Clean Water Act, Section 1049(b) (3) and the Safe Drinking Water Act, Section 1442I (3) by investigating the ways in development patterns have affected public health in low-income, largely minority communities through stormwater runoff and the contamination of surface water, which interacts with local groundwater. The purpose of NCEEP is to engage High School students in the discovery, research, and ongoing monitoring of water in their school communities. To do so in a manner that promotes public participation in the access to information, these students will research their neighborhood's development patterns and learn how these issues relate to Memphis's larger history. Research will expose how development focused on expanding beyond the urban core has unjustly burdened low-income communities with economic, environmental, and health impacts of sprawl, particularly in regards to inadequate stormwater systems and management. The student-participants will apply their knowledge through a scientific study of surface and ground water in their school communities as well as their watershed. Finally, the students will compile the results of their sampling and testing and develop skills to advocate for change by: writing letters to local officials, presenting to neighborhood groups, and organizing events or campaigns to raise awareness of water quality issues within their communities. Short terms goals include an increased number of youth who are aware of the environmental impacts of the city's development pattern, increased awareness of how the built environment interacts with the natural environment, and a better understanding of water quality, specifically as it relates to research and monitoring studies. Goals that are more long term include an effectively engaged community equipped with empirical evidence. This will in turn allow them to advocate for policies focused on the prevention, reduction, and elimination of water pollution. These goals serve to lay the foundation for longer term changes in the local environment, including an increase in dollars reinvested in existing neighborhoods, decreased contaminant levels, and protection of drinking water as a resource.

II.Environmental, Public Health and Community Climate Resiliency (if applicable) information about the Affected Community

The local environmental/public health issue(s) that the project seeks to address:

Suburban investment in roads and other transportation infrastructure, coupled with continued employment migration to suburban areas, drives sprawling development patterns in Memphis. The continuation of this development pattern has lead to an abandonment of the urban core of the city in terms of proper monitoring of neighborhood infrastructure ranging from sidewalks and abandoned lots to adequate stormwater systems. This increased stormwater runoff, combined with industrial output on a channelized watershed which interacts with groundwater, raises

environmental health concerns. These environmental health concerns begin with residents of these isolated neighborhoods, which include children, the elderly, and low-income households. Additionally, these concerns affect all citizens of the Greater Memphis area in that it unduly affects their access to safe drinking water.

The local environmental/public health results the project seeks to achieve:
Abandoned neighborhoods have much to gain from an educated and engaged populace and a new voice for redevelopment of existing municipal infrastructure. One of the benefits includes equipping high school students with the skills and understanding necessary to not only participate in a water quality monitoring project, but to effectively analyze and communicate these results to the broader community. Beyond youth involvement in education, this project seeks to create more livable neighborhoods that will return the urban core into a sector that provides services, job opportunities, and safe, healthy neighborhoods. Raising awareness and engaging students in issues affecting them outside of the classroom as well as paving the way for a reinvisioning of a largely abandoned sector of the city are the primary results NCEEP seeks to achieve.

The characteristics of the affected community: Historically, public infrastructure investments have not been distributed equitably. The injustice of this pattern culminates in a number of compounding negative results: the transit system is stressed by dispersed service areas and low density population; those who remain in inner-city neighborhoods have limited access to jobs and services like health care and healthy food; residents suffer from asthma and obesity; blight is rampant among these neighborhoods. Located in Shelby County, in the southwestern corner of Tennessee, the city of Memphis (pop. 680,768) is predominantly African American (61.1%). The median income in the city is $35,807 nearly $25,000 below national average. 26.2% of Memphis's residents live below poverty level; only 20.9% have obtained a bachelor's or higher degree. Shelby County has the 3rd highest infant mortality rate in the country.

How the affected community may be disproportionately impacted by the environmental, public health and community climate resiliency (if applicable) harm(s) and risk(s):
In an effort to control flooding, municipal governments dredged and channelized Nonconnah Creek between 1936 and 1946. Continued industrial development of the Southern half of Memphis, served by the Nonconnah Creek Watershed, with maintenance occurring only at bridge sites contributed to unfettered streambank erosion. Simultaneously, residential developments began to favor more suburban settings. These two development patterns have served to largely separate nodes of industry from residential areas, with neighborhoods along the urban corridor served by the Nonconnah Creek watershed being the exception. This legacy places these communities at the intersection of the built and natural environment, with public and environmental health issues at the forefront. The U.S. Army Corps of Engineers and the Tennessee Department of Agriculture ,in a 1973 Environmental Impact Report, were critical of the "present trend of developing the floodplain for maximum short-range returns." This report goes on to state "unregulated and destructive practices of land development are rapidly depleting and destroying basin resources." With a shallow sediment bed, Nonconnah Creek serves as the watershed for residential and industrial sectors. With a largely dysfunctional stormwater system, neighborhoods in this area have to deal with flash floods and pooling water as well as industrial contamination of their channelized drainage system. Additionally, Nonconnah Creek's largely silt streambed is a vital recharge area for local groundwater. According to the EPA's 2008 Toxic Release Inventory Report, Shelby County releases nearly 12.5 million pounds of toxic material wastes into land, air, and water annually. Additionally, the City of Memphis ranks 81st on the list of America's least safe cities.

How the affected community will benefit from the results:
NCEEP aims to develop young leaders within the South Memphis community by meaningfully involving them in the scientific and political process. Empowered and impassioned citizens are vital to reversing development trends that create public and environmental health hazards. By gathering scientific information, the students participating in this workshop will have empirical evidence about the quality of their water and will be thus equipped to speak factually to the community at large. This project will also yield increased partnerships between inner city High School students and non-profit groups such as Livable Memphis. Working with researchers from the University of Memphis will enable students to gain job skills and vocational training in STEM fields. Outside the scope of this proposed project, neighborhoods along the Nonconnah Corridor will experience a reinvestment in infrastructure alongside decreased measurable water toxins.

III. Organization's Historical Connection to the Affected Area

Organization's involvement with the affected community, including the length and how:
Since it's inception in 2008, Clean Memphis has worked at a grassroots level in the neighborhoods and communities along the Nonconnah Corridor by creating and supporting partnerships that meet on a monthly basis to address issues of litter and blight. These partnerships represent over 48 neighborhood associations. Clean Memphis is actively involved in assisting the partnerships to organize community clean ups, identify and address blighted properties and a variety of beautification efforts. Clean Memphis has also worked with local government (both city and county) to provide storm water education to residents and is also involved with the Community Development Council of Greater Memphis's Policy Committee. Clean Memphis also created a "Sweeps" program using court-ordered workers and inmates to perform routine litter pickup in high-traffic areas to prevent litter from entering the watershed. The Sweeps program removes over 12,000 bags of litter annually from major streets along the corridor. Adding an educational component in 2011, Clean Memphis expanded its focus to the next generation of environmental stewards. In that time, the educational program has reached over 15,000 students in settings ranging from standards based classroom presentations to environmental fairs and service learning projects. By melding the community-wide clean up efforts and the outreach in schools, Clean Memphis staff began to connect the dots as it relates to development patterns, inadequate infrastructure maintenance, local watershed health, and groundwater recharge. Clean Memphis acts largely as a conduit between community members, schools, and resources such as outside community groups, non-profits, and redevelopment entities.
How the organization has worked with the affected community's residents and/or organization to address issues:
As part of a three year project, Clean Memphis is working to use schools in the Nonconnah Creek Watershed as the center for all other community efforts. By employing this bottom up approach, Clean Memphis has been actively involved at the classroom level in over ten schools in the focus area. These presentations are followed up with a variety of service learning projects, from energy efficiency outreach by students, to marking storm drains, picking up litter and roadway debris, and even working on blighted properties. Outside of these direct efforts to engage the students, Clean Memphis continues to focus on supporting the citizens of these communities through helping address issues brought forth at the neighborhood association and partnership meetings. Clean Memphis service as a resource for organizational help, volunteer recruitment, supplies and attracting corporate sponsorships to assist the communities in addressing cleanup and blight issues they feel are important. Clean Memphis also assist in addressing blight issues the city and county are not able to address.
How the residents of the affected community are part of the decision making process:

By playing a supporting role and bringing resources to bear around issues which are brought to the attention of the community associations, Clean Memphis' involvement in community affairs has centered on assisting the unique challenges each neighborhood faces. Programming in schools has been conducted in a similar fashion, tailoring presentation content to the interests of students and teachers, who themselves live in the school community. For example, a group of students from Carver High School in the Riverview neighborhood expressed interest in energy efficiency and solar panel feasibility and Clean Memphis educators provided a week long energy audit training for the students which culminated in a community outreach "Green the Block" event. The concerns of the residents serve to guide all the efforts of Clean Memphis in the community.

How the organizations' efforts have increased the community's capacity to address local environmental, public health issues and how the organization maintains and sustains an ongoing relationship with the community's residents and/or organizations:

Clean Memphis works to create educated and engaged communities by providing supplies, project planning, training for residents to identify and report code violations, how to organize community based cleanup efforts, expand their volunteer base and to attract corporate partners. We have also helped with printing of code violations in english and spanish and provide additional volunteers for community based projects. Clean Memphis works to develop additional support from the non-profit and government sector, Clean Memphis has been actively involved in addressing the issues that citizens of the target community identify. Examples include providing painting supplies and expertise for a student-centered school beautification project, getting permission from municipal government to work on abandoned and blighted properties, and helping to plan community clean ups that engage students, parents, teachers, and the elderly. By attending each of the monthly partnership meetings, performing regularly scheduled litter sweeps, and reporting code violations to city government, Clean Memphis is a fixture at community gatherings and school events. Having had a constant presence in the community for six years, the organization has forged meaningful relationships and worked to move the neighborhood forward. Through engaging youth of all ages as well as attending meetings of the, Clean Memphis is able to maintain a working relationship with the varying age and interest groups that exist within the community.

IV. Project Description

NCEEP is a 7 part workshop designed for high school students that consists of 4 in-class sessions, a day of fieldwork training, and two days of student-led data collection in the field. This program will be delivered to 3 high schools in urban settings in the Nonconnah Creek watershed throughout the 2015-2016 academic year, with extended data collection, advocacy, and service learning to take place in the summer of 2016. By providing background on the development history of Memphis, the curriculum seeks to further student understanding of their neighborhood surroundings. To further this sense of place and illustrate the ways in which the built environment interact with the natural environment in an urban setting, the history and function of Nonconnah Creek as a watershed will be stressed. From there, students will have guest speakers from the University of Memphis' Groundwater Institute to explain to them the link between stormwater runoff, watershed health, and surface-to-groundwater interaction. The rest of the project will center on training students in fieldwork methods and involving them in the collection of data related to groundwater contamination. By participating in this technical component, students will not only develop skills as budding scientists, but will also be equipped with specific factual information about all aspects of water in their community. The project goals include: educating students on the economic and environmental impacts of suburban development, engaging students in the scientific process, and developing skills needed to

advocate for change on the basis of evidence. However, the scope of this project is not limited to high school students and is designed to increase the community's public participation in the access to information.

Output #1- Education: The NCEEP classroom component will educate participants on how continual investment in development beyond the urban core of the city has resulted in an inequitable distribution of resources and failed to maintain the built environment in older neighborhoods. Students will see how this has, in turn, affected the natural environment and had negative impacts on their watershed.
Measurable for Output #1: Over the scope of this project, 75 High School students will complete the NCEEP workshop.

Output #2- Scientific Skills Acquisition: By training students in the proper protocol for sampling, testing, and analyzing groundwater data as well as delineating drainage basins, NCEEP will increase the rigor of a typical high school course and expose students to careers in the environmental research realm.
Measurable for Output #2: By the end of the project, students will create a basic presentation poster to display their findings.

Output #3 Data Collection: In partnership with the University of Memphis Groundwater Institute, NCEEP will yield geochemical samples of groundwater in the shallow sediment recharge area of Nonconnah Creek for analysis. Additionally, stormwater modeling will be included as part of a larger research initiative underway by the City of Memphis Stormwater and the Groundwater Institute.
Measurable for Output #3: Groundwater samples will be taken and analyzed monthly as well as stormwater flow mapped for the neighborhoods surrounding schools.

Output #4 Creating Advocates and Building Capacity: NCEEP will equip high school students with quantitative and qualitative information on the declining state of their built environment and the ways in which that is threatening the public health aspects of safe drinking water. Presenting this information in a concise, digestible manner will be practiced in a classroom setting, then carried out at neighborhood association meetings, local partnership meetings, and presented to the Community Development Councils for each school.
Measurable for Output #4: Presentations on the findings of fieldwork will be given to the public in 2 formats for each of the 3 schools, with suggestions for abatement measures.

How the project is related to the environmental statutes you identified in your Threshold Eligibility Form:

NCEEP is unique in that it encompasses municipal development, elements of the built and natural environment, coordination of research, and effective advocacy through an educational platform. Specifically, these efforts directly align with the Clean Water Act, Section 104(b) (3) in that the program trains students on the coordination of surface and groundwater research in a heavily industrial area. The the ongoing monitoring of the extent to which both surface and groundwater contain contaminants serves to support the Clean Water Act, Section 104(b) (3) as well. In addition, the educational and fieldwork components of NCEEP will provide training and education around the public health aspects of providing safe drinking water, in accordance with the Safe Drinking Water Act, Section 1442l (3). As a registered 501c(3) non-profit organization, Clean Memphis will provide the in-class components of NCEEP, but will partner with other entities like Livable Memphis. The University of Memphis will provide guest speakers in addition

to the technical training and consulting related to sampling and testing protocol. The local water utility, Memphis Light Gas and Water, will work alongside the City of Memphis Stormwater to delineate, map, and marcate the drainage basin.

ii) A concise description of how the organization and its partner(s) will work together during the year to address the local issue(s).

The role of your partner(s) in addressing the local environmental/public health issue:
To effectively address the environmental and public health issues associated with inadequate stormwater infrastructure and groundwater contamination, Clean Memphis has assembled a group of experts to deliver different components of NCEEP. Specific tasks include: revising the curriculum by Livable Memphis, training students in sampling procedure by the University of Memphis, assisting with drainage basin analysis and mapping by Memphis Light Gas and Water, and locating, mapping, and marking by City of Memphis Division of Stormwater.

Outside of the classroom and fieldwork, neighborhood organizations would serve on a community panel to receive the results of the study presented by the students. The neighborhood associations will also be involved in promoting the findings and advocacy of the students.

The nature of the organizations and what they bring to the partnership:
Clean Memphis has an established program of holistic environmental education, with a particular focus on scientific literacy and service learning projects. The existing, ongoing relationships Clean Memphis has with community and neighborhood associations will help to strengthen the reach of the program overall. As the grassroots arm of the Community Development Council of Memphis, Livable Memphis has a particular strength in program and curriculum design around neighborhood safety, functionality, and livability. Since 1991, The Groundwater Institute at the University of Memphis has been a regional leader in applied research, modeling, and protection of groundwater resources. With Clean Memphis educators delivering the in-class sessions for the students, Livable Memphis providing assistance in curriculum design, and the Groundwater Institute engaging students in research and data collection, these partner groups will engage students and empower them to advocate for change in their neighborhoods. Memphis Light Gas and Water and the City of Memphis Division of Stormwater will partner on the education and evaluation of current stormwater infrastructure.

How the partners have a vested interest in working with this partnership, commitments made, and specific activities it will be responsible for; and how the applicant plans to maintain and sustain the partnerships:
Having worked closely with each of the partner organizations on similar education and outreach efforts, Clean Memphis constantly draws on each of the partners' areas of expertise. While the focus of Clean Memphis is watershed health through environmental education and litter abatement efforts, the scope of this project furthers the individual missions of each partner organization. Livable Memphis stands to gain by promoting investment in the urban core of the city and speaking to students and community members about the outcomes of sprawl. In a similar fashion, The Groundwater Institute is actively involved in a multi-year research initiative to test groundwater samples taken from the recharge area of Nonconnah Creek. The City of Memphis in the middle of a ten year drainage basin assessment by neighborhood. The goal of their 10 year project is to better understand the functional capacity of storm water systems. Above all the combination of technical areas of expertise will benefit students in largely

underserved, overburdened, and low-income high schools. All data collected will be part of larger projects, not merely collected and discarded. The success of a multi-faceted project such as NCEEP will be used as a model for further collaboration, with an emphasis on engaging students and empowering communities.

V. Organizational Capacity and Programmatic Capability

The organizational and administrative systems (e.g. accounting programs) the organization has in place that will be used to appropriately manage, expend, and account for Federal funds: Clean Memphis has a contract CPA to manage all aspects of bookkeeping through QuickBooks. This firm also prepares all of our 990s and has extensive knowledge of nonprofits and accounting principles and practices. Clean Memphis Board of Directors meet monthly to review and approve financial reports. Additionally, the Executive Director has been working in the nonprofit management field for almost seven years, has written, implemented and reported on numerous grants and has received a Master Certification in Nonprofit management with an emphasis on financial reporting.

How the applicant has successfully managed these projects in the past:
Clean Memphis has never received Federal Funds before however, Clean Memphis has existed primarily on grant and foundation funding for the last six years all of which requires extensive reporting and delivering established outcomes. Clean Memphis has also received funds from city, county, and state governments in the form of reimbursement agreements. Over the past five years Clean Memphis has successfully managed multiple grants totally over $700,000. These grants range in size from $10,000 to $125,000. All of these grants were successfully implemented and reported. The grants range from local foundations such as the Hyde Foundation, Turley Foundation, Poplar Foundation to City, County and State Government and national organizations like AutoZone Foundation and Coca-cola Foundation. Janet Boscarino is responsible for all documentation, regular grant reports, final reports to include pictures and other related materials. All of our organizations have continued their support due to our program success accountability and documentation.

How the applicant plans to effectively manage and successfully complete this proposed project:
The process will begin by reaching out to schools with which Clean Memphis has an established relationship and securing a commitment. From there, the teachers and administrators will meet with all partner organizations to create a workable timeline within the academic calendar of the school system. Clearly defining responsibilities and deliverables for all partner organizations will help to create a sense of urgency and accountability. Backwards planning will be used in all aspects of the project from classroom sessions, to sample testing, mapping, and scheduling student presentations to community groups. Working within the confines of an academic year, the aspects of the project that are student-centered will need to be completed by May. The summer of 2016 will be used to debrief and complete grant reporting requirements.

Organizational experience to successfully achieve the goals of the proposed project:
Having collaborated with other non-profit groups to design and execute educational programming focused on another local watershed, Clean Memphis is established in the areas of curriculum design and delivery. In the 2013-2014 academic year, Clean Memphis worked in

nearly 50 schools, most of which included at least one return visit. Aside from a depth and breadth of experience in local schools, Clean Memphis has also worked closely with the Groundwater Institute on education and outreach surrounding groundwater resources. Outside of the educational experience, Clean Memphis has a strong background in supporting communities and neighborhoods at the grassroots level. As part of a three year project funded through the state of Tennessee, Clean Memphis is involved in a project similar to NCEEP for Elementary and Middle schools along the Nonconnah Corridor. The NCEEP proposal is the perfect marriage of rigorous environmental education and supporting community advocacy efforts. Clean Memphis has extensive experience in using the expertise of a variety of local entities to engage multiple stakeholders on an issue that influences a particular community. As of January 2015, Clean Memphis does not have experience in managing federal funds.

VI. Qualifications of the Project Manager (PM)

The qualifications of the PM as they relate to the project:

Andrew Murphy, Education Coordinator for Clean Memphis, will serve as the Project Manager for NCEEP. He holds a degree in Environmental Studies and, prior to working for Clean Memphis, was a full-time science teacher. Since joining the Clean Memphis education team, he has focused his efforts on aligning environmental education presentations to state standards and connecting students to their local environs. In addition to working for Clean Memphis, Murphy also holds a Research Assistant Position with the University of Memphis.

How the PM has ties to the community and/or organization:

Building on the previous five years of education and outreach in schools and community centers, Murphy joined the staff a year and a half ago and has worked closely with several schools in the area to increase students' environmental literacy. With a focus on increased meaningful involvement and ongoing visits to schools, he has built ongoing partnerships with principals, students, and staff at several high schools along the Nonconnah Corridor. These efforts extend beyond the classroom and include establishing school-wide recycling, service learning, community clean ups, and school beautification projects.

Past activities that the PM has worked on with the community:

To promote environmental education that is meaningful to students, Murphy has facilitated basic water testing comparison labs at area high schools including GRAD Academy Memphis and Freedom Prep. Academy. In the spring of 2014, he worked with a group of high school students from the Soulsville Charter School on a five-part neighborhood mapping project that culminated in a "fight the blight" project on two properties in school community. Throughout the fall of 2014, Murphy has established energy efficiency patrols and trained students to audit their school facility at GW Carver High School as well as the Soulsville Charter School. Each of the schools mentioned has participated in a litter pick up project as well. This involvement and continued presence has allowed Murphy to gain the trust of school administrators, the neighborhood police precincts, and the broader community.

VII. Past Performance in Reporting on Outputs and Outcomes

Poplar Foundation - $38,000 per year for two years. (2012 and 2013) Watershed Education in target schools. Provided the seed funding to launch our education funding around watershed health. Glenda Yarbrough. gyarbrough@poplarfdn.org
Semi-annual report based on the number of students reached, materials covered, percentage mastery of content, evaluation from teachers and service projects. Final report compiling all numbers.

Hyde Foundation - $25,000 Community Engagement around Cleanup/Blight - Lauren Taylor. ltaylor@pittcomanagement.com. Semi-annual report. Information tracked through Salesforce - Number of Residents engage, number of code issues reported/mitigated, number of cleanups organized by communities, amount of trash collected, number of presentation to community organized. Number of students engaged in classroom and service learning.
The Hyde Foundation has provided Clean Memphis funding since 2009.
Shelby County Government - $25,000 2012-2013- Litter Abatement - Lee Hinson
Quarterly report based on cleanup locations, number of cleanups, volume of trash collected, windshield survey of improved areas. lee.hinson@shelbycountytn.gov

VIII. Quality Assurance Project Plan (QAPP) Information

Given the technical aspect of this project, it is anticipated that a QAPP will need to be developed in accordance with the guidelines listed by the EPA.
The project will primarily involve the collection of new environmental data. Existing environmental data will be used to educate residents on existing conditions.